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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Fireworks

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## GENERAL SCIENCE

# Oppenheimer's "Security"

Transcript of the hearings concerning Dr. J. Robert Oppenheimer's security clearance, as well as two briefs filed by lawyers in his behalf, have now been made public.

► TRANSCRIPT OF the hearings in the security clearance procedure against Dr. J. Robert Oppenheimer by the Atomic Energy Commission have now been made public.

Also released are two briefs of Oppenheimer's lawyers, one addressed to the special hearing board, the other to the five AEC commissioners now reviewing the scientist's appeal from a two-to-one denial of his security clearance by this board. (See SNL, June 12, p. 371.)

The commissioner's decision on the appeal is expected before the end of June.

Publication of the 992-page record by the AEC, a departure from established custom for federal agencies in security procedures, was abrupt and preceded the commissioner's final decision in order to "best serve the public interest."

Rep. Chet Holifield (D-Calif.) has urged a congressional investigation of the transcript's release.

Scientific testimony at the hearings showed that the H-bombs tested in the Pacific this spring were far different from the theoretical hydrogen weapon being discussed in the fall of 1949. It was Dr. Edward Teller's "brilliant discovery" tested and proved in 1951 that made possible the hydrogen weapons of 1952 and 1954.

The hearings began April 12 in room 2022 of the AEC's T-3 building at 17th and Constitution in Washington.

Dr. Gordon Gray, chairman of the special board, opened the hearings by noting they were being held under provisions of the Atomic Energy Act of 1946 because of "information which casts doubt upon the eligibility of Dr. Oppenheimer" to have access to classified information.

He then read Maj. Gen. Nichols' letter of charges against Oppenheimer, dated Dec. 23, 1953, and Oppenheimer's reply dated March 4, 1954. (See SNL, April 24, p. 259.)

Dr. Gray stated that the proceeding was "an inquiry and not in the nature of a trial." Before swearing Oppenheimer in as a witness, he pointed out that the hearings were considered as "strictly confidential between Atomic Energy Commission officials participating in this matter and Dr. Oppenheimer, his representatives and witnesses. The Atomic Energy Commission will not take the initiative in public release of any information relating to the proceeding before this board."

This statement was made to all witnesses before they were heard by the board.

In releasing the testimony, for which it is understood consent of the witnesses but not of Oppenheimer's lawyers was obtained, the AEC charged that the scientist's attorneys had issued texts of some documents.

These documents, the attorneys said, were the two letters mentioned above, containing the charges and Oppenheimer's reply, the decision of the Gray board and his attorney's reply. (See SNL, April 24 and June 12, op. cit.)

On June 16, the day after the testimony was released, it was revealed that a 100-page summary of the transcript, had been temporarily lost by AEC commissioner Eugene M. Zuckert over the weekend of June 12. The next day, however, it was learned that this temporary loss had nothing whatever to do with the AEC decision to publish the full transcript.

The hearings ended on May 6, with about 600,000 words of testimony from the following witnesses as well as from Oppenheimer and his wife.

Called by the special board were five University of California scientists—Dr. Edward Teller, Dr. Wendell M. Latimer, Dr. Kenneth S. Pitzer, Dr. Luis Alvarez and David Griggs—as well as two Army officers, Maj. Gen. Roscoe C. Wilson and Col. Boris T. Pash, and William L. Borden, formerly executive director of the Joint Committee on Atomic Energy.

Dr. E. O. Lawrence, who had been called as a special board witness, was prevented from attending by illness. He did, however, present an affidavit on one point of issue.

The witnesses appearing for Oppenheimer included five former atomic energy commissioners—Gordon Dean, David E. Lilienthal, Robert F. Bacher, Sumner T. Pike and T. Keith Glennan—as well as ten former and present members of the AEC's General Advisory Committee: Hans Bethe, Oliver E. Buckley, James B. Conant, Lee A. duBridge, Enrico Fermi, James B. Fisk, I. I. Rabi, Hartley Rowe, John von Neumann, Walter G. Whitman, John H. Manley, former GAC secretary, testified by affidavit.

Others who testified to Oppenheimer's loyalty and security were: Mervin J. Kelly, Lt. Gen. Leslie R. Groves, Karl T. Compton, Col. John Lansdale Jr., Jerrold B. Zacharias, Frederick H. Osborn, George F. Kennan, Henry A. Winne, Vannevar Bush, Norris Bradbury, James R. Killian Jr., Norman F. Ramsey Jr., Maj. Gen. James McCormack Jr. and Charles C. Lauritsen.

(Transcript of the hearings—with security material deleted—are being made available at the Government Printing Office, Washington 25, D. C., at an estimated cost of \$2.50. The publication is titled "In the Matter of J. Robert Oppenheimer—Transcript of Hearing Before Personnel Security Board." Inquiries concerning availability of the two briefs filed by Oppenheimer's lawyers should be addressed to Herbert Marks, Ring Building, Washington 6, D. C.)

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**NATURAL PRESSURE OIL FLOW**—At Mene Grande, Venezuela, oil flows today from natural underground gas pressure exactly as it did millions of years ago. Oil seeping out of the earth was first discovered there over 400 years ago by Spaniards.

## GENERAL SCIENCE

# Secret Device for H-Bomb

► THE GREATEST secret and mystery in atomic energy today is Dr. Edward Teller's "flash of genius" that made possible the H-bomb.

Revealed in the transcript of the hearing before the Atomic Energy Commission's special personnel security board, it is now known that Dr. J. Robert Oppenheimer's criticized technical advice not to attempt the making of the H-bomb was superseded by a discovery that made possible the super-bomb.

It was something that even the most expert had not previously imagined.

Was it an undiscovered property of light chemical elements, perhaps some sort of combination of lithium and the double weight hydrogen, deuterium?

Was it a way of producing extremely high temperatures, billions of degrees, without exploding an A-bomb or a fission bomb? Perhaps this could be done by exploding metallic wires with heavy jolts of electricity.

The most valuable secret about the H-bomb was unmasked when it became known that there had been an actual explosion of an H-bomb.

This recalls the fact that it had been said early in the atomic bomb program that the greatest secret revealed after the end of the war was the fact that the atom bomb actually did explode. Until there had been an explosion of a uranium bomb, the scientists as well as the military men of all nations were not absolutely sure that the atom bomb could be made.

This was equally true with the hydrogen bomb.

Since the Russians have presumably exploded a hydrogen bomb, whether of the same kind that we have or not we do not know, it may now be possible to tell the world a little more about what actually did happen in the development of the H-bomb.

Highly respected scientists have raised most seriously the question as to whether it might not be wise to tell much more about current progress in atomic energy, even things that are now classified super-secret, in order that many of the fertile scientific minds throughout the world may be able to build upon this new and novel information and thus speed the application of atomic energy to peaceful purposes.

It is quite possible that Dr. Teller's development hinted at in the Oppenheimer controversy may be the key to the actual application to peaceful purposes of the hydrogen bomb reaction. Power will be obtained for industrial purposes from uranium, although the power program has been sidetracked for a considerable number of years by military necessity. However, if energy can be obtained from part of the mass of the light and relatively plentiful elements, such as lithium and deuterium, and if it can be done without a tremendous explosion, then the door has been opened to a much better industrial application of

atomic energy than has ever been contemplated before.

What this country needs now is a Smyth Report on the hydrogen bomb similar to the famous report which Dr. Henry D. Smyth, now an AEC commissioner, published in 1945 telling about the A-bomb development.

There is real reason to believe that telling more facts and so-called "secrets" rather than bottling up current research, as is now being done, would pay dividends even to our own military program by making possible new and fertile developments by those who are now excluded as so many are from the Q-clearance councils of our atomic energy program.

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## GENERAL SCIENCE

## Science Editorial Hits Oppenheimer Decision

► THE SECURITY regulations under which Dr. J. Robert Oppenheimer's access to classified information was suspended by the Atomic Energy Commission are on trial as well as the scientist himself, Dr. Dael Wolfe charges in *Science* (June 18).

*Science* is the weekly magazine of the American Association for the Advancement of Science, an organization of some 250 scientific groups whose members total nearly 1,000,000.

A special security review board held two-to-one that Oppenheimer was "loyal" and "discreet" but that he should be barred from atomic secrets. The board findings are now before the five AEC commissioners for a ruling.

One point made by the two-man majority in recommending against restoring Oppenheimer's Q-clearance was his conduct in the hydrogen bomb program, particularly for not "enthusiastically" supporting it.

The implications of the criterion of "enthusiasm" as a basis for security clearance are "grave and frightening," Dr. Wolfe says.

"Adherence to such a doctrine," he points out, "will dampen free discussion—not only in public but in secret councils."

"Who wants to risk such drastic punishment, years after a decision was made, for having honestly opposed the decision before it was made?" he asks.

Other members of the AEC's advisory committee who agreed with Oppenheimer in opposing a crash H-bomb program at one time could face the same fate, Dr. Wolfe points out.

He says that hearings before the security review board in the Oppenheimer case were conducted in a "democratic" and "judicial" way, for which "the country can take great pride." However, Dr. Wolfe notes that the procedure "brings out some of the diffi-

culties of the security regulations, some of the troublesome aspects of the attempt to judge who is a security risk, some of the tremendous cost to the nation that must lose the services of a uniquely qualified adviser in order to comply with regulations of unknown validity and perhaps temporary applicability.

"The majority report leaves the status of Dr. Oppenheimer in doubt. It also leaves doubts about the security regulations under which he was judged," Dr. Wolfe concludes.

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## GENERAL SCIENCE

## Scientists Hope for Oppenheimer Clearance

► THE NATION'S scientists will feel much better about doing scientific work for the Atomic Energy Commission if the five commissioners overturn a special security board's two-to-one finding against Dr. J. Robert Oppenheimer and restore his access to top secret atomic information.

They are now most appalled by the contention that Oppenheimer should have given his enthusiastic support to the hydrogen bomb program. Most scientists believe that government advisers, whether or not they are scientists, must be free to express their honest opinions without fear of attacks made later on the basis of hindsight.

Reading the 992-page transcript of testimony taken by the special security board confirms what many scientists had feared: the charges against Oppenheimer are his activities and associations of more than ten years ago, several times previously evaluated, and officially expressed opinions and recommendations concerning the H-bomb program.

Most scientists see grave consequences to this country by the injection into a security case of Oppenheimer's alleged lack of "enthusiasm" for all-out H-bomb development. They point out that a stifling of new scientific developments upon which the future security of our country must be based could result from barring Oppenheimer's access to atomic secrets on such a basis.

These scientists reason that if government advisers must be enthusiastic, advice would soon be coming only from enthusiastic "yes-men," and men of independent minds would be eliminated from government councils.

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## GENERAL SCIENCE

## Communism Is Modern Tyranny—Oppenheimer

► "IT IS a cruel and humorless sort of pun that so powerful a present form of modern tyranny should call itself by the very name of a belief in community, by a word 'communism' which in other times evoked memories of villages and village inns and of artisans concerning their skills, and of men of learning content with anonymity."

Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study and center of controversy over his AEC clearance, thus comments upon communism in the book, "Science and the Common Understanding" (see p. 410), containing lectures that he gave last year in England.

"It is true that none of us will know very much," Dr. Oppenheimer writes, "and most of us will see the end of our days without understanding in all its detail and beauty the wonders uncovered even in a single branch of a single science."

"Most of us will not even know, as a



**INTERCHANGEABLE SECTIONS FOR MATADOR**—This photograph shows the assemblies in which the USAF B-61 Martin Matador is now being manufactured. The seven interchangeable components are weatherproofed and crated for assembly and later use, eliminating the final assembly line operation.

member of any intimate circle, anyone who has such knowledge; but it is also true that, although we are sure not to know everything and rather likely not to know very much, we can know anything that is known to man, and may, with luck and sweat, even find out some things that have not before been known to him.

"This open access to knowledge, these unlocked doors and signs of welcome, are a mark of a freedom as fundamental as any. They give a freedom to resolve difference by converse, and, where converse does not unite, to let tolerance compose diversity. This would appear to be a freedom barely compatible with modern political tyranny. The multitude of communities, the free association for converse or for common purpose, are acts of creation. It is not merely that without them the individual is the poorer; without them a part of human life, not more nor less fundamental than the individual, is foreclosed."

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## TECHNOLOGY

## Zirconium Powder Gives Fourth of July Effect

### See Front Cover

► NOT A Fourth of July sparkler, but a scientific experiment is the cause of the brilliant flash of light shown on the cover of this week's SCIENCE NEWS LETTER.

In a scientific experiment, Bob Anderson, a General Electric research engineer, is burning a zirconium metal powder, used in most flashbulbs to ignite the shredded aluminum foil. The flying sparks are so tiny that they are harmless to the engineer.

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## AERONAUTICS

## Now You Can Assemble Your Own Guided Missile

► THE B-61 Matador guided missile is now on an assemble-it-yourself basis, but you will have to join the Air Force before you can have a shot at putting this supersonic puzzle together.

Packaged for shipment in seven wooden crates, the ground-to-ground flying weapon achieves for the first time one of the aircraft industry's fondest goals: interchangeable sections.

It is no longer necessary for a complete missile to be assembled in the Glenn L. Martin plant, then wrapped in a bulky package and shipped to its destination. The interchangeable sections permit elimination of much custom tailoring. A tail section that fits a B-61 with Serial No. 1000 will also fit a missile bearing Serial No. 1274.

The easy-to-store sections can be left crated until they are needed, then assembled just before the weapon is launched.

The seven interchangeable sections of the missile are its nose, wing, center, aft tail, fin and bullet fairing stabilizer and its instrumentation.

The Matador is the first pilotless ground-to-ground missile to be sent overseas for duty. Currently the Matadors are in Germany. The first of two pilotless bomber squadrons has completed its training at the Missile Test Center at Cocoa, Fla., and now is in Europe.

Under the power of its turbojet engine, the Matador streaks along at speeds comparable to the Air Force's latest jet fighter planes. When it dives on its target, it cracks the sonic barrier.

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## BIOCHEMISTRY

# New Test for Cancer

Measuring the tiny electric difference between inside and outside of cells is new approach to the detection of cancer of the uterus or cervix. Test is still in research stage.

► DOCTORS HAVE come up with an entirely new approach for testing whether women have cancer of the uterus or cervix. The test is done by actually measuring the electric difference between the inside and outside of single tiny cells cast off from the birth canal.

The first preliminary report was made to the Chicago Gynecological Society by Drs. S. A. F. Lash and Ralph W. Gerard, of the University of Illinois, and Dr. G. Falk of the University of Chicago.

The test is a simple one, they say; any skilled technician can do it in 15 minutes. Here is the way they say it works.

First they take an instrument called a speculum and insert it in the vaginal opening, click it shut and remove it again. This simple procedure collects some mucous secretions in which there are tiny cells that have been sloughed off from the linings of the vagina and uterus.

They place this bit of material on a glass slide. Then they take a tiny glass tube with a tip so fine it is only one-half a micron, or a fifty-thousandth of an inch, in diameter. They thrust this tip, which is really an electrode, into the inside of a single cell.

Another electrode is placed on the outside of the cell, and they both are attached to accurate instruments that tell the difference in electric charge between the inside and outside of the cell. All that the technician has to do is read numbers on a galvanometer. The procedure is repeated on 25 to 30 cells.

If most of the readings are slightly negative, the woman does not have cancer. If most of the readings are positive by a moderate amount, there is some kind of cancer in the uterus or in the cervix. Sometimes the electrode potential patterns seem to differ with different kinds of cancer.

The technique of measuring electric charges of single cells is one that Dr. Gerard has used for many years in basic research in nerve physiology, for which he is well known. He used the same apparatus to measure the electric charges and conduction in nerve and muscle cells to try to find some of the secrets of how our nervous system works. Dr. Lash got the idea of trying it on cells of the vaginal tract, and so he tried it on women who came to him for various female sex disorders.

Drs. Lash, Gerard and Falk found that the positive and negative readings, when properly interpreted, told whether the women had cancer of the uterus or of the cervix.

In their first series of 57 cases, the test showed 20 women had this cancer; 18 of these later were proved to have cancer, but

two really did not. The test also showed that 35 women did not have cancer, which was right in every case. In further tests, there has never been a false negative test, and the positives were about 94% correct. The doctors hope that with the test, they will be able to pick up a few cases earlier than before possible.

Many doctors feel that this study, as are others, is bringing basic research and clinical practice closer together in working out the problems of disease.

Drs. Lash and Gerard stress that this is just a preliminary report. The test is purely in the research stage and is not ready for widespread use. They will not even know whether it will be worth using clinically for at least a year.

"We are not yet claiming anything for it," Dr. Gerard said. "It may or may not have any practical value for use in the doctor's office or hospitals, but the method opens up new opportunities for research, because it is now apparent that the apparatus can be put into many kinds of cells." He puns that "the potentials are good."

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## MEDICINE

## Filtered Cigarettes

► PATIENTS WITH diseases of the blood vessels and circulation should not be misled by current filtered cigarette advertising, warns Dr. Irving S. Wright of New York.

Patients with such diseases, particularly with the one called thromboangiitis obliterans, or Buerger's disease, cannot safely smoke cigarettes, filtered or otherwise, he declares in a letter to the *Journal of the American Medical Association* (June 12).

Dr. Wright is a recognized authority on heart and blood vessel diseases and a former president of the American Heart Association.

Dr. Wright and associates have tested a variety of filtered cigarettes as well as "so-called denicotinized cigarettes" during the past years. They have yet to find any that contain tobaccos which do not have an effect on the blood vessels.

"There is absolutely no evidence that there is any protection in terms of vascular (blood vessel) disease from these brands," he states. "On the other hand there is quite strong evidence that such protection is completely lacking."

If patients with blood vessel disease resume smoking as some have, their disease may be reactivated. Dr. Wright reports one

## • RADIO

Saturday, July 3, 1954, 3:15-3:30 p.m. EDT  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. James Ross Westman, chairman of the department of wildlife conservation and management, College of Agriculture, Rutgers University State University of New Jersey, will discuss "Why Fish Bite."

## TECHNOLOGY

## New Furnace Turns Out High-Purity Titanium

► BETTER, CHEAPER titanium for tomorrow's airplanes now is being turned out in a new electric furnace that melts ingots of the lightweight "wonder metal" in a vacuum.

The Titanium Metals Corporation of America has found that its new furnace improves the quality of titanium melted in it. The reason is believed to be that more hydrogen is extracted from the titanium ingot when it is melted in a vacuum than when it is melted in an artificial atmosphere of argon.

Hydrogen is more detrimental to titanium's high-strength, heat-resistant qualities than has been previously thought.

The vacuum technique also fosters more stable electric arcs, larger power inputs, and the production of smooth ingots requiring little or no conditioning before they are converted into sheet metal for frames.

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such case of a man who first had thromboangiitis in 1940. So long as he did not smoke, and with appropriate treatment, his disease remained quiet and he was free from symptoms.

About four months ago, impressed by filtered cigarette advertising, he started to smoke filtered cigarettes. His disease has been reactivated and he has early signs of impending gangrene in the tips of two toes.

Cigarette filter tips and filters have been reported to prevent considerable quantities of tars and other oils from reaching the smoker's lungs. It has been implied that this may reduce the danger of lung cancer attributed by some authorities to cigarette smoking. On this point, Dr. Wright says, he can make no comment.

He objects, however, that "the present advertising implies protection in rather vague, but none the less impressive terms." Such advertising has already influenced some patients and may influence more with blood vessel disease to resume smoking which their physicians had banned.

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Many babies begin to develop day-night sleep patterns by their third week of life.

## ASTRONOMY

# Mars Approaching Earth

The ruddy planet, earth's neighbor in the sky, is making its closest approach to earth in 13 years on July 2. Astronomers are training their telescopes on this planet.

By JAMES STOKLEY

► SHINING BRILLIANTLY on July evenings in the southern sky is the red planet Mars, now making its closest approach in 13 years. On July 2 it will be only 39,740,000 miles away. This may not seem very near, but it is almost next door, astronomically speaking!

Its brightness is minus 2.2 on the astronomer's scale, which is greater than any other star or planet now visible except one. The exception is Venus, visible in the western sky for more than two hours after sunset.

With magnitude minus 3.5, about three and a third times as bright as Mars, there is no doubt about the identity of Venus, since it is the first to be seen as dusk is falling.

The accompanying maps show the appearance of the July evening skies, about 10:00 p.m., your own variety of standard time, at the beginning of July; 9:00 p.m. the middle of the month and 8:00 p.m. at the end. (Add one hour for daylight time.)

Thus it will be seen that Mars is in the constellation of Sagittarius, the archer. On the right is Scorpius, the scorpion.

In the latter group shines the star Antares, whose name means "rival of Mars," given on account of its red color. The two bodies now appear so near together that it is easy to compare them, although Mars is about 25 times as bright at present.

The planet, of course, shines by sunlight that it reflects, while the star is a distant sun, shining by its own light.

A little farther to the west, in Virgo, the virgin, a third planet can now be seen. This is Saturn, about half again as bright as the star Spica, seen to the right, which is about the same as Antares in brilliance.

The most prominent star now visible in the evening is Vega, in Lyra, the lyre, which shines high in the east. It is about twice as bright as Antares or Spica, due in part to the fact that it is so much higher and shows off to better advantage.

Two others of the first magnitude can be seen beneath Vega. The one to the southeast is Altair, in Aquila, the eagle. To the left of Altair is Deneb, in Cygnus, the swan.

## Aid in Locating Bootes

Second only to Vega in brightness among the July evening stars is Arcturus, in Bootes, the bear-driver, a constellation seen in the southwest above Virgo.

Another good way to locate Arcturus is

to look to the northwest for the familiar great dipper, in Ursa Major, the great bear.

The two stars that are in the lower part of the dipper, called Dubhe and Merak, marking the outer part of the bowl, are the well-known pointers, and a line from these, to the right, brings you to Polaris, the pole star. But now look above, at the stars that form the dipper's handle, and follow their curve southward. This brings you first to Arcturus, then to Spica.

In addition to the three planets already mentioned, Mercury will appear briefly as a morning star, low in the east just before sunrise, about July 26, when it will be farthest west of the sun.

In July, Jupiter is too close to the sun to be seen easily, although by August it too will be a morning "star."

## Mars Orbit Not Circular

If the orbit of Mars, and also that of the earth, around the sun were truly circular, the approach of the two planets would be a very simple matter. The mean distance of earth from the sun is 93,000,000 miles, that of Mars is 141,500,000 miles.

With circular paths, they would always be closest when in the same direction from the sun, the distance being 48,500,000 miles, the difference between 141,500,000 and 93,000,000.

When on opposite sides of the sun, Mars and the earth would be farthest, separated by 234,500,000 miles, the sum of their individual distances from the sun.

The orbit of earth is nearly circular. On July 3 we are in "aphelion" or farthest from the sun, at a distance of 94,500,000 miles, which is 3,152,000 miles more than we were last Jan. 2. The orbit of Mars is considerably more lopsided, for that planet varies

about 26,000,000 miles in distance from the sun.

At the closest approach of these two orbits they are only 34,500,000 miles apart. Every year, about Aug. 28, the earth reaches the part of its path nearest that of Mars, but it very rarely happens that Mars is there at the same time.

It was in 1924, and then Mars was less than 35,000,000 miles away, closer than it will be for centuries. The year 1939 brought the next close visit, with a distance of 36,171,000 miles. The present approach is very close, but in September, 1956, it will be still better, with 35,400,000 miles, almost as good as 1924.

## Observed by Many Astronomers

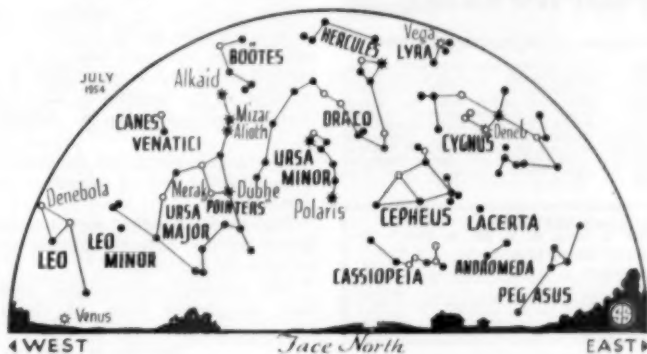
At observatories all over the world astronomers are now busily studying Mars, in an attempt to solve some of the problems presented by this orb. The 200-inch Hale telescope at Mt. Palomar, the largest in the world, was not in operation when Mars last was close in 1939.

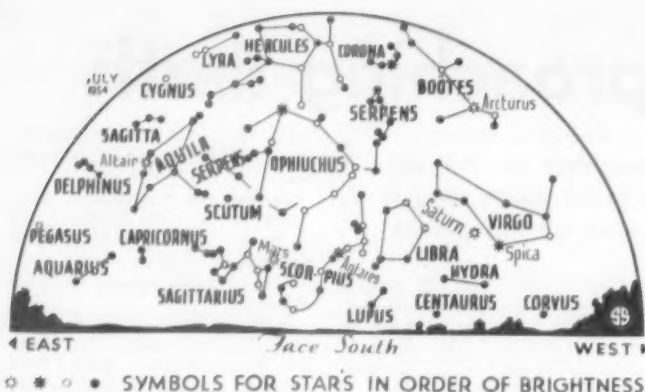
While mainly used for observations of far more distant objects, some of its precious time is being devoted to Mars, along with many smaller instruments.

It so happens that whenever Mars makes a close approach to earth, it is well to the south. For northern observers, it is therefore low in the sky, but from southerly countries it is high overhead. Thus observatories south of the equator have an advantage, and special observations are being made from South America, Australia and South Africa.

Dr. E. C. Slipher of Lowell Observatory, Flagstaff, Ariz., one of the leading authorities on Mars, has gone to the Lamont-Hussey Observatory of the University of Michigan, located at Bloemfontein, South Africa, to make observations that, it is hoped, will give a more accurate determination of the size of Mars.

As a result of all this work, by the end of the year we should know considerably





more about Mars than we did before. Perhaps we will know what exactly are the mysterious markings called "canals." Perhaps we will learn more about the constitution of its atmosphere, and can assess more accurately the possibility of some sort of life on that planet.

From this year's work, it should be possible to plan an even more comprehensive program for 1956, when the red planet makes its closest approach since 1924. Truly, the next few years should be memorable ones in Martian study.

On the evening of July 15 there will be a partial eclipse of the moon, but it will be over before the moon rises in the middle and western parts of the country. Even along the Atlantic seaboard, the moon will already be eclipsed when it rises.

The moon will only partly enter the shadow of the earth; at the height of the eclipse, which occurs at 7:20 p.m., EST, about 41% of the lunar diameter will be covered by the shadow, enough to make the moon look distinctly queer. At 7:31 p.m., the moon will be out of the shadow and the eclipse will be over.

### Celestial Time Table for July

July	EST	
2	3:00 a.m.	Mars nearest earth, distance 39,740,000 miles.
3	9:53 a.m.	Moon passes Venus.
3	3:00 p.m.	Earth farthest from sun, distance 94,500,000 miles.
6	midnight	Mercury between earth and sun.
7	8:33 p.m.	Moon in first quarter.
9	3:00 a.m.	Moon farthest, distance 251,000 miles.
	12:51 p.m.	Moon passes Saturn.
13	7:18 p.m.	Moon passes Mars.
15	7:29 p.m.	Full moon, partial eclipse of moon.
22	7:14 p.m.	Moon in last quarter.
23	2:00 p.m.	Moon nearest, distance 229,600 miles.
26	10:00 p.m.	Mercury farthest west of sun, visible around this time in eastern sky just before sunrise.
28	early a.m.	Meteors visible radiating from constellation of Aquarius, the water carrier.
29	5:20 p.m.	New moon.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, June 26, 1954

### PSYCHIATRY

## Neurotics Say "I" Most Frequently

► NEUROTIC PATIENTS are "I" persons, it appears from how often they use the pronoun, "I," in speech.

This and use of pronouns generally more often than nouns are distinctive features of their language habit patterns, Drs. Maria Lorenz and Stanley Cobb of Boston reported at the meeting of the American Neurological Association in Atlantic City, N. J.

The manic patients use the fewest adjectives, reflecting lack of subjective qualifications.

The obsessive-compulsives are the most liberal users of adverbs, showing emphasis on quantity and degree.

The paranoid schizophrenic stands out least sharply in terms of characteristic language traits.

Science News Letter, June 26, 1954

### MEDICINE

## Relieve Some Pain For Cancer Patients

► CANCER PATIENTS and perhaps others with such severe pain that large doses of narcotics do not relieve it can be helped by a new drug called chlorpromazine.

The drug steps up the pain-relieving power of narcotics so that a large dose that was ineffective alone gives relief of pain. In some cases pain relief can be had from a smaller dose of the narcotic.

Results showing this are announced in the *Journal of the American Medical Association* (June 12) by Drs. Max S. Sadove, Myron J. Levin, Raymond F. Rose, Lester Schwartz and Frederick W. Witt of the Veterans Administration Hospital at Hines, Ill., and the University of Illinois College of Medicine, Chicago.

Chlorpromazine offers the extra advantage of helping to stop the nausea and vomiting that are frequent in advanced cancer.

The drug seems to alter the patient's reaction to pain, probably accounting for some of its effect in helping them get relief from previously ineffective doses of narcotics.

"We observed that patients, some of whom stated that the degree of their pain was not appreciably altered, were more relaxed and had a more cheerful outlook," the doctors report.

Drowsiness is the chief side effect of the drug. To a less extent, it may cause dryness of the mouth, heartburn and mild low blood pressure.

With continued use of the drug, patients need progressively increasing amounts for a constant effect. Whether this was because their pain was getting worse or because they were developing tolerance to the drug is not known.

In large enough amounts, chlorpromazine produced unconsciousness. It therefore should not be used, the doctors warn, in unconscious states caused by barbiturates, opiates, alcohol and other drugs that depress the central nervous system.

Chlorpromazine is a phenothiazine compound. Its ability to prolong and intensify the action of narcotics and anesthetics was first reported by French scientists. Recently Canadian and U. S. physicians have reported that it has a remarkable quieting effect on very disturbed mental patients, and even helped some improve enough to leave the hospital.

This developed from reports of its sedative action when used as an anti-nausea and anti-vomiting drug. French scientists have also used it to reduce the amount of narcotics, sleep-inducing drugs and anesthetics required for surgical operations.

The drug was originally developed by Rhone-Poulenc Laboratories in France. It is marketed as Thorazine by Smith, Kline & French Laboratories, Philadelphia.

Science News Letter, June 26, 1954

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**APPLIED ATOMIC ENERGY**—K. Fearnside, E. W. Jones and E. N. Shaw—*Philosophical Library*, 156 p., illus., \$4.75. Presenting the background knowledge of nuclear physics necessary for an understanding of modern applications of atomic energy to peaceful purposes.

**ASTROPHYSICS: Nuclear Transformations, Stellar Interiors and Nebulae**—Lawrence H. Aller—*Ronald*, 291 p., illus., \$12.00. Stressing not merely the results of astrophysical research but also the methods by which they are obtained.

**BEYOND THE GERM THEORY: The Roles of Deprivation and Stress in Health and Disease**—Iago Goldston, Ed.—*Health Education Council*, A New York Academy of Medicine Book, 182 p., illus., \$4.00. Not negating the importance of the germ as a cause of disease, but showing that it is not the germ alone, but the body's fitness to withstand the germ which determines health and sickness.

**DREAMS AND NIGHTMARES**—J. A. Hadfield—*Penguin*, 244 p., paper, 65 cents. The author says that dreams concern themselves with those problems of our lives which in the daytime we find too much for us. He has developed his own theory of the origin and nature of dreams, based on 36 years of study.

**THE ECZEMAS: A Symposium by Ten Authors**—L. J. A. Loewenthal, Ed.—*Livingstone* (Williams & Wilkins), 267 p., illus., \$7.50. This symposium was planned to contain material of interest to the general practitioner, the pediatrician, the allergist and other specialists.

**ETHICS**—P. H. Nowell-Smith—*Penguin*, 324 p., paper, 85 cents. No attempt is made to give solutions to everyday problems, but to aid in decision making through giving better understanding of the words we use.

**THE FIRST AUSTRALIANS**—Ronald M. Berndt and Catherine H. Berndt—*Philosophical Library*, 144 p., illus., \$4.75. Since the coming of the European to Australia, the aborigines have been pushed back into the interior and have been reduced in numbers. Now they are largely forgotten. This book is by an anthropology team of the University of Sydney.

**THE FLEMISH MASTERS**—Horace Shipp—*Philosophical Library*, 128 p., illus., \$6.00. Twenty-four full color plates and 16 in black and white make this readable book about the great artists of Flanders very beautiful.

**FORM IN ENGINEERING DESIGN: The Study of Appearance During Design and Development**—J. Beresford-Evans—*Oxford University Press*, 96

p., illus., \$1.70. Discussing the application of such principles as proportion to the design of a variety of structures, from bridges to faucets.

**THE FORT MONMOUTH SECURITY INVESTIGATIONS AUGUST 1953-April 1954—Scientists' Committee on Loyalty and Security—*Atomic Scientists of Chicago*, 49 p., paper, 75 cents. Over 120 charges are summarized and the cases against six individuals are cited in detail. The probable long-range effect of these investigations on the laboratory's research and development program is evaluated.**

**FRENCH INSTITUTIONS: Values and Politics**—Saul K. Padover with the collaboration of Francois Goguel, Louis Rosenstock-Franck and Eric Weil—*Stanford University Press*, Hoover Institute Studies, Series E Institutions, No. 2, 102 p., illus., paper, \$1.50. Depicting some of the ideas and ideals which influence French life and politics.

**FUNDAMENTALS OF TRANSISTORS**—Leonard M. Krugman—*Rider*, 140 p., illus., paper, \$3.70. Intended as a practical book for the technician and amateur.

**HOW TO LOCATE AND ELIMINATE RADIO & TV INTERFERENCE**—Fred D. Rowe—*Rider*, 122 p., illus., paper, \$1.80. Each TV channel has a band width of 6,000 kilocycles, as contrasted with each broadcast channel which is only 10 kilocycles wide. For this reason, the television receiver is much more susceptible to interference than is a radio, the author says.

**HOW TO PREPARE FOR COLLEGE ENTRANCE EXAMINATIONS**—Samuel C. Brownstein and Mitchell Weiner, edited by Stanley H. Kaplan—*Barron's Educational Series*, 221 p., \$3.95. Including advice on the selection of a college and a compilation of entrance requirements.

**HUNTER'S CHOICE: True Stories of African Adventure**—Alexander Lake—*Doubleday*, 254 p., illus., \$3.50. Fast-moving tales of animals, men and the jungle.

**IMPAIRMENT STUDY, 1951—*Society of Actuaries*, 300 p., \$7.50. A study of the mortality among life insurance policyholders known to have had physical impairments at the time the insurance was issued to them. Longevity has improved materially for persons with such impairments.**

**MERCHANT SHIPS: BRITISH BUILT: Vessels of 300 Tons Gross and Over Completed in 1953—Introduction and section reviews by A. C. Hardy and Laurence Dunn—*Adlard Coles in association with George G. Harrap (John De Graff)*, 168 p., illus., \$5.00. A register of new ships.**

**NEW BIOLOGY 16—M. L. Johnson, Michael Abercrombie and G. E. Fogg, Eds.—*Penguin*, 133 p., illus., paper, 50 cents. Among the articles are four on the origin of life and one on two living fossils.**

**THE NEXT FIFTY YEARS OF FLIGHT—Visualized by Bernt Balchen and told to Erik Bergaust with foreword by James H. Doolittle—*Harper*, 214 p., illus., \$3.00. The visualizer foresees small orbital rockets circling endlessly around the earth, and even gigantic space stations, which may become a reality within the next ten years. He is a Norwegian flyer and Arctic explorer.**

**OUR CHANGING WEATHER**—Carroll Lane Fenton and Mildred Adams Fenton—*Doubleday*,

110 p., illus., \$2.50. Describing for young people and also their elders how weather is formed. Beautiful photographs add to the interest.

**A PHILOSOPHICAL STUDY OF THE HUMAN MIND**—Joseph Barrell—*Philosophical Library*, 575 p., illus., \$6.00. The author explains that he has borrowed truths from the various schools of psychology; the amalgamation of the truths so gleaned is here presented.

**PROBLEMS OF AGING: Transactions of the Fifteenth Conference, January 20, 21 and 22, 1953, Princeton, N. J.—Nathan W. Shock, Ed.—*Josiah Macy, Jr., Foundation*, 213 p., illus., \$4.25. Papers given at one of a series of conferences where experts from various specialties exchange views and findings. Here the problem of aging is discussed with regard to what happens at the cellular level.**

**PROBLEMS OF INFANCY AND CHILDHOOD: Transactions of the Seventh Conference, March 21 and 24, 1953, New York, N. Y.—Milton J. E. Senn, Ed.—*Josiah Macy, Jr., Foundation*, 196 p., \$2.75. Discussing a variety of problems such as those developing from early mother-child separation and the modern way of leaving the newborn with the mother.**

**PROGRESS AND PROBLEMS IN MENTAL HOSPITALS: Proceedings of the Fifth Mental Hospital Institute—Daniel Blain and Stella B. Hanau, Eds.—*American Psychiatric Association Mental Hospital Service*, 204 p., paper, \$2.50. Spectacular crimes committed by veterans recently emerged from mental hospitals have alarmed the public. It is interesting to learn here that the crime rate of veterans who have been in one large hospital is one-third that of the general population.**

**PSYCHOANALYSIS AND THE EDUCATION OF THE CHILD**—Gerald H. J. Pearson—*Norton*, 357 p., \$5.00. Psychoanalysis has many implications for education as well as therapy. Here they are

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brought together with the philosophy of the author as an aid to teachers and parents.

**THE PSYCHIATRIC INTERVIEW**—Harry Stack Sullivan, edited by Helen Swick Perry and Mary Ladd Gawel with introduction by Otto Allen Will—Norton, 246 p., \$4.50. A posthumous book based on two lecture series given in the Washington School of Psychiatry on the conduct of interviews. This is not a practical handbook of suggestions on how to get people to talk freely, but rather a distillation of Dr. Sullivan's thinking on the basis of which you can form your own suggestions.

**PSYCHOLOGY, THE NURSE AND THE PATIENT**—Doris M. Odium—Philosophical Library, 2d ed., 168 p., \$4.75. A book for nurses on some of the human problems that arise in their profession.

**A REPORT ON TAIWAN'S POPULATION TO THE JOINT COMMISSION ON RURAL RECONSTRUCTION**—George W. Barclay—Office of Population Research, Princeton University, 120 p., illus., paper, \$2.50. The author spent nearly a year on Taiwan as demographic consultant to the Commission. The population growth is now tremendous, and seems likely to continue high, due to appreciation of large families and enforced ignorance of contraception.

**RESECTION-RECONSTRUCTION OF THE HIP: Arthroplasty With an Acrylic Prosthesis**—Jean Judet and others, K. I. Nissen, Ed.—Livingstone (Williams & Wilkins), 151 p., illus., \$7.00. This book, originally written in French, describes the method designed by the senior author and his brother.

**RESIDUAL STRESSES IN METALS AND METAL CONSTRUCTION**—William R. Osgood, Ed.—Reinhold, prepared for the Ship Structure Committee under the direction of the Committee on Residual Stresses, National Academy of Sciences—National Research Council, 363 p., illus., \$10.00. Gathering together reports of research of value to persons concerned with why welded ships fail.

**SCIENCE AND THE COMMON UNDERSTANDING**—J. Robert Oppenheimer—Simon and Schuster, 120 p., \$2.75. The author, eminent nuclear physicist, stresses that the scientist's search for truth is based on communication with other people, on agreement as to results of observation and experiment. (See p. 405.)

**TECHNICIAN'S GUIDE TO TV PICTURE TUBES**—Ira Remer—Rider, 154 p., illus., paper, \$2.40. A simple guide for the inexperienced repair man and a handy reference book for the "old timer."

Science News Letter, June 26, 1954

## GOLF: Your LEFT SHOULDER makes the amazing difference!

One of the most startling discoveries to emerge from wide research in the golf swing is that your swing literally hinges on your left shoulder!

How this is so and how to use this great discovery to improve your own game beyond all expectations in a matter of short weeks is set forth in **THE GOLF SECRET** by Dr. H. A. Murray—a medical doctor, golfer, and golf researcher, who has applied his expert knowledge of anatomy in this sweeping and utterly different study of the golf swing.

This method has now been tested on a large scale and been found to yield simply astounding results! Not only do golf scores take a sudden drop, but with the new method good golf is a hundred times easier than bad—because it is **NATURAL** (not strained) golf.

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Poison Sumac

► **MOST PEOPLE**, when they hear for the first time that poison ivy is really a sumac, are inclined to be a little incredulous.

The plant does not really look much like a sumac. But it takes no argument in the case of poison sumac. This venomous shrub of the bogs is hard to distinguish, at first glance, from its harmless cousin of the uplands.

It is very easy to get poisoned with poison ivy; that happens on Sunday school picnics and the mildest of country walks, for poison ivy is everywhere. Poison sumac is reserved

for slightly harder souls who go in for hiking or nature-study activities that may require wet feet, because poison sumac is a creature of the bog-edges, and does not grow in upland woods at all.

This is perhaps fortunate, for though fewer persons are susceptible to it, the luckless ones it does affect get a much worse "dose," usually, than poison ivy is able to inflict.

Poison sumac is easy enough to identify although it looks much like ordinary sumac, except that its bark is a pallid gray.

The chief stigmata by which the poisonous sumac may be separated are the fruits. Last year's fruit-clusters persist on both kinds, as a rule, so that they may be looked for at any season. Poison sumac fruits are lax clusters of pallid white berries, hanging down.

Common sumac fruits are tiny dark brown or sooty things that look a good deal like coarse coffee grounds, and their dense clusters stand stiffly erect.

Furthermore, the two plants grow in totally different kinds of terrain. Poison sumac is a shrub of lowlands, preferring the soggy soil of acid-water bogs. Common sumac is a plant of the well-drained upland soils.

A third sumac, the harmless staghorn sumac, grows in wet places, but it can be told from the poisonous species by the sooty fuzz on its upper branches, and by its fruits, which are like those of the common sumac.

Science News Letter, June 26, 1954

### AERONAUTICS

## Astronauts Really Realists

► **YOU MAY** laugh at the man who longs for the day when he will flit from planet to planet, but an Air Force official considers the starry-eyed astronaut a real realist.

Theodore von Karman, chairman of the U.S. Air Force scientific advisory board, says the era of Buck Rogers may be reasonably close at hand.

He says that nuclear rockets may have to be developed first to give a space ship the speed it needs to escape from the earth's gravity. Otherwise, it may take no more effort to create a manned space rocket than it took to develop today's supersonic aircraft from the Wright brothers' plane of 1903, he speculates.

Scientific and engineering societies should welcome the serious-minded astronaut, and should open their technical journals to his papers discussing the problems of space travel, Dr. von Karman believes. After all, he says, the astronomical and interplanetary societies of today are much more scientific than the aeronautical societies were in the late 19th century.

One topic for publication would be how to return safely to the earth, or how to land on another planet. The return to earth is a real puzzler—air friction would be so high as the rocket zooms into the earth's atmosphere that all known materials would be heated beyond their endurance.

Dr. von Karman, a leading figure in aerodynamics, points out that more research must be conducted in the dynamics and physics of rarefied, ionized gases. Research also is needed in the exploration of the highest altitude reachable by sounding rockets, the effects of radiation on humans and materials, navigation problems and the development of unmanned rockets.

Dr. von Karman's views on future space activities form the concluding part of his book, "Aerodynamics" (see SNL, June 12, p. 380).

Science News Letter, June 26, 1954

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## PSYCHOLOGY

# Motives for Suicide

► INTENSE HATRED of a person previously both loved and hated is the commonest motive for attempted suicides in persons suffering from psychopathic states, it appears from a study of 200 consecutive cases of attempted suicide admitted to a general hospital in a two-year period.

The study is reported by Dr. I. R. C. Batchelor, deputy physician superintendent of the Royal Edinburgh Hospital for Mental and Nervous Disorders, Edinburgh, Scotland, to the *British Medical Journal* (June 12). At least one-fifth of attempted suicides are suffering from psychopathic states, Dr. Batchelor estimates.

The attempted suicide follows its stimulus, often a quarrel, so fast that the number of such acts which could be forestalled would be very small. Prevention, or prophylaxis, therefore must start in childhood when, or before, the first signs of emotional instability, social maladaptation or delinquency appear.

Almost three-fourths of a group specially studied came from broken homes. There

was a history of psychiatric abnormality in 67% of the cases and of suicide in the family in 14%.

Nearly one-third had not been complaining of nervous symptoms and one-half were not under the care of a doctor.

Besides hate, most significant motives for the attempted suicides were evasion, identification with a dead person, fears, experimentation, the demonstration of omnipotence, and manipulation of the environment.

Most of the attempts were impulsive. Alcohol and fatigue were significant factors, along with quarrels, in precipitating the attempt.

In some cases the would-be suicide tries to turn the tables on the hated person and make the suicide look like murder by the hated person. An example Dr. Batchelor gives is the case of a youth who tried to poison himself with his mother's drugs because she humiliated him before others by ordering him to take his cap off in the house.

Science News Letter, June 26, 1954

## STATISTICS

# Long-Lived Women

► WOMEN LIVE longer than men for at least 11 reasons, an authority consulted by the American Medical Association, Chicago, says in answer to a question from a physician. The reasons, given in the *Journal of the American Medical Association* (June 12), are:

1. "Males are less resistant to disease than females and this is true from birth onward.

2. "Likewise, the death rate is higher for males than females under adverse conditions.

3. "More males are born dead than females, and this is also true among some animals, including cattle, pigs, and rats.

4. "Not only is the death rate higher among males at birth and during the first day of life, but also practically each year and by about the same percentage.

5. "Nearly all diseases and defects cause more deaths among males than females.

Exceptions are cancer, diabetes, exophthalmic goiter and gallstones.

6. "Many men die from causes that affect women much less often, such as murder, industrial accidents, alcoholism, and suicides.

7. "Men are exposed to many more hazards due to their work, and these include accidents, violence and infections.

8. "The death rate among women from childbirth has been reduced drastically in the last 15 years.

9. "Lung cancer has increased far more among men than among women.

10. "Heart disease takes a much greater toll among men than women.

11. "Improvements in home equipment and safety devices and better and quicker medical and surgical treatment have markedly cut down serious accidents to women in the home."

Science News Letter, June 26, 1954

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## DENTISTRY

## Demand for Dentists Doubled in 20 Years

► ALMOST TWICE as many Americans are going to their dentists today as a generation ago. About 42% of the population, 65,000,000 persons, sought dental treatment in 1952, compared to between 20% and 25% in 1929, the American Dental Association estimates on the basis of a nation-wide survey of dentists.

Science News Letter, June 26, 1954

# Questions

ASTRONOMY—What is the closest Mars can ever approach the earth? p. 409.

□ □ □

BIOCHEMISTRY—What is a new test for cancer? p. 406.

□ □ □

GENERAL SCIENCE—What may Dr. Edward Teller's "flash of genius" lead to? p. 404.

What does Dr. J. Robert Oppenheimer consider the modern tyranny? p. 405.

□ □ □

MEDICINE—Should people with blood vessel diseases smoke filter cigarettes? p. 406.

□ □ □

PSYCHIATRY—Who uses "I" most often? p. 408.

□ □ □

Photographs: Cover, General Electric Company; p. 403, Hamilton Wright; p. 405, The Glenn L. Martin Company; p. 416, Owens-Corning Fiberglass Corp.

## MEDICINE

## B Vitamin Needed for Healthy Blood Vessels

► CHOLINE, ONE of the B vitamins, is needed to keep the heart and blood vessel system healthy, Drs. George F. Wilgram, W. Stanley Hartroft and Charles H. Best of the University of Toronto, Canada, have discovered.

Their findings, reported in *Science* (June 11), apply to young rats. They will have to be confirmed on other species of laboratory animals before their possible significance for human health is considered, the scientists state.

Choline is also needed for healthy livers and kidneys. It was Dr. Best who discovered almost 20 years ago that fatty infiltration of the liver could be cured by choline.

Now he and his associates find that young rats after short periods on a diet low in choline and high in fat, as well as older rats on choline-deficient diets for longer periods, develop damaged heart arteries and aorta. The walls of these important blood vessels get fat deposits and show sclerosis, or hardening.

Science News Letter, June 26, 1954

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# • New Machines and Gadgets •

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❁ **ASBESTOS SIDING** shingle is treated with water-turning silicones so that rain-borne dirt will not mar the beauty of your house, and so that streaks will not appear under window sills. Made of asbestos fibers and portland cement, the shingles become stronger with age and have the permanence of stone.

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❁ **COLORED BATHTUB** caulk is packaged in a tube, like toothpaste, and is tinted blue, green, pink or tan to harmonize with your bathroom fixtures and tile. It dries in an hour to a tight waterproof seal that does not shrink or crumble. Its colors stand up to the most vigorous scrubbing with scouring powders.

Science News Letter, June 26, 1954

❁ **SPOTLIGHT FOR autos** is hand-held, or can be hung up by a hook on its back. Plugging into a cigarette lighter, the butyrate plastic spotlight can throw its beam one-quarter of a mile. It stores easily in the glove compartment, holding its 12-foot cord on a built-in reel.

Science News Letter, June 26, 1954

❁ **WATER SKIS**, made of a plastic reinforced with glass fibers, have great impact strength, will not splinter, do not need repainting and have a smooth surface for fast skimming over the water. A special core



material makes the skis, shown in the photograph, float in water.

Science News Letter, June 26, 1954

❁ **FIRE STARTER**, particularly good for lighting charcoal under outdoor grills, is packaged in a push-button can and is squirted on the fuel. It can be applied to charcoal, briquettes or wood, and lit quickly with a match.

Science News Letter, June 26, 1954

❁ **BABY FOOD** jar handler is used to retrieve hot jars from saucepans and then is inserted in a holder which is attached to the high chair tray. Accommodating two jars at once, it also opens baby food containers so the lids may be reused for storage.

Science News Letter, June 26, 1954

❁ **MASONRY COATING** is a vinyl resin-base material that can be sprayed, brushed or rolled on walls of concrete, brick, cinder block, plaster, asbestos shingles or steel. Drying in 20 minutes, it seals pores to make the surfaces more resistant to weathering, abrasion, and moisture.

Science News Letter, June 26, 1954

❁ **JUICE EXTRACTOR** slings out the juice of fresh fruits and vegetables using centrifugal force. Powered by a 1/4-horsepower motor, the machine does not crush or bruise the food. Its bowl is made of butyrate plastic, and a spout at the bottom delivers the juice to a drinking glass.

Science News Letter, June 26, 1954

## Do You Know?

Viruses are living organisms capable of reproduction, but they also have some of the characteristics of inorganic matter.

One out of every six pounds of aluminum in this country goes into the manufacture of airplanes.

Schools have doubled their offerings in science in the last 24 years.

No place in North Carolina's 1,224-acre Mount Mitchell State Park is less than a mile above sea level.

An average person can oxidize the alcohol contained in a two-ounce drink of 100-proof whisky in three hours.

The smallest of all sparrows, the chipping sparrow, weighs less than one ounce.

Ultraviolet radiation produces genetic mutations, both lethal and visible, in fruit flies.

As early as 1546, an Italian, Girolamo Frascatoro, suggested in a book that diseases are caused by tiny organisms, with a specific one for each disease.

Because of extensive landslides, a large number of wells have been damaged or totally ruined in the Ventura Avenue oil field, the second largest current source of oil in California.



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